

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT B. RHODES, HARVEY E. ATWOOD
and JOHN E. GORMAN

Appeal No. 95-3976
Application 08/164,733¹

ON BRIEF

Before JOHN D. SMITH, WEIFFENBACH and WARREN, **Administrative Patent Judges.**

WEIFFENBACH, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims

¹ Application for patent filed December 7, 1993. According to appellants, the application is a division of Application 08/083,857, filed June 25, 1993, now abandoned, which is a continuation of Application 07/790,610, filed November 8, 1991, now abandoned.

15-20 which are all of the claims remaining in the application. Claim 15, the sole independent claim on appeal, was amended by an amendment after final which was approved for entry by the examiner (paper nos. 15 and 16). We affirm.

Claimed Subject Matter

The claims on appeal are directed to a process for improving the viscosity index of a base oil by forming a star polymer and then blending the polymer with a base oil. On page 3 of the brief, appellants acknowledge all of the pending claims stand or fall together. Accordingly, we will limit our consideration to claim 15 which reads as follows:

15. A process for improving the viscosity index (VI) of a base oil, comprising the steps of:

sequentially polymerizing styrene, isoprene, and a polyalkenyl coupling agent to form a star polymer having the formula $(A-B)_n-X$ wherein B is a hydrogenated block of polyisoprene having a number average molecular weight (MW_1) between 30,000 and 60,000, A is a block of polystyrene having a number average molecular weight (MW_2) from 3,000 to 4,000, X is a nucleus of the polymerized polyalkenyl coupling agent, and n is the number of block copolymer arms in the star polymer when coupled with 2.5 or more moles of the polyalkenyl coupling agent per mole of living block copolymer molecules;

recovering the star polymers as a solid crumb; and

blending a VI improving amount of the star polymer crumb with a base oil.

Reference of Record

The following reference of record is relied upon by the examiner in support of the rejection of the claims:

Eckert

4,156,673

May 29, 1979

The Rejection

Claims 15-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 as obvious over Eckert.

Opinion

We have carefully considered the respective positions advanced by appellants and the examiner. For the reasons set forth below, we will sustain the examiner's rejection.

Claim 15 is directed to a process for improving the viscosity index of oils. The process comprises sequentially (i) polymerizing styrene, isoprene and a polyalkenyl coupling agent such as a polydivinylbenzene to form a star polymer having the formula $(A-B)_nX$ to form living block copolymer molecules, wherein A is a block of polystyrene, B is a block of polyisoprene, X is the polyalkenyl coupling agent, and n is the number of block copolymer arms in the star polymer when coupled with 2.5 or more moles of the polyalkenyl coupling agent per mole of living block copolymer molecules; (ii) recovering the

star polymer as a “solid crumb”; and (iii) blending the star polymer with a base oil. The claimed process further limits the average molecular weight of polyisoprene to between 30,000 and 60,000 and the average molecular weight of polystyrene to be from 3,000 to 4,000. The core of the star polymer is the polyalkylene coupling agent while the polymeric arms of the star are formed by the poly(isoprene/styrene) block copolymer.

The examiner determined that the claimed process was anticipated by Example 13 of Eckert under 35 U.S.C. § 102(b). Eckert discloses preparing a living poly(isoprene/styrene) block copolymer wherein the average molecular weight of polyisoprene is 41,000 and the average molecular weight of polystyrene is 4,000.² The examiner found that all elements of the claimed invention were disclosed by Eckert except for forming a “solid crumb.” The examiner held that the recovery of the star polymer as a “solid crumb” would be inherent from the teachings of Eckert. Appellants argue that Example 13 of Eckert describes a star polymer having the styrene blocks next to the core of the star polymers (i.e. at the inner end of the polymeric arms) whereas the claimed composition requires the styrene blocks to be away from the core at the outer end of the polymeric arms. Appellants further argue that “Eckert at best suggests recovering polymers having small terminal styrene blocks as a solid crumb and Applicants are not aware of precedent holding that patentability can be denied based upon the inherent result of a suggested invention” (reply brief:

² The example does not explicitly disclose the average molecular weight for polystyrene, but it does disclose the average molecular weight of polyisoprene as being 41,000 and the average molecular weight of the polyisoprene/polystyrene block copolymer as being 45,000. It is reasonable to presume that the difference (45,000 - 41,000) would be the molecular weight of polystyrene in the block copolymer.

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p.3).

We do not find appellants' arguments persuasive. Forming a poly(styrene/isoprene) block copolymer where styrene would be at the outer end of the polymeric arm is within the scope of Eckert's anticipatory disclosure. Eckert describes the star polymers as having a dense center or nucleus of a polyalkylene coupling agent and a number of polymeric arms represented by the formula $ABX(BA)_n$ where n is the number of arms, X is the polyalkenyl coupling agent nucleus, A can be styrene block and B can be the isoprene block (col. 3, lines 43-45 and 52; col. 6, lines 23-38). While the sequence of Example 13 may be opposite to that claimed, Example 12 discloses the sequence as claimed herein. Eckert discloses recovering the star polymer in "solid form" (col. 8, lines 23-24) which can then be blended with the oil (col. 8, lines 34-36). Appellants have not defined in the specification the meaning of the phrase "solid crumb," but the ordinary meaning of the phrase would be a small solid fragment which would be encompassed by Eckert's "solid form."³ Moreover, appellants state in their brief that "[a] solid polymer can be either a solid mass ... or a solid crumb which is much easier to handle than a solid mass" and that the star polymers included in Eckert's claim 33 could be recovered as a solid "crumb" (brief: p.5).⁴ We consider this as an admission that recovery of a solid mass within the scope of Eckert would inherently include recovery as a solid "crumb."

³The *American Heritage Dictionary*, 2nd Edition, Houghton Mifflin Company, Boston, Mass., p. 345 (1982) defines "crumb" as being "[a] small fragment or scrap."

⁴ Claim 33 in Eckert is directed to a composition wherein the hydrogenated conjugated diene block (e.g. isoprene) is attached to the polyalkenyl nucleus and the molecular weight of the monoalkenyl aromatic block (e.g. styrene) is between 4,000 and 5,000.

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For the foregoing reasons, we agree with the examiner's holding that the claimed subject matter on appeal is anticipated by Eckert. Since anticipation is the epitome of obviousness, the rejection of claims 15-20 under 35 U.S.C. § 103 is also affirmed. **In re Pearson**, 494 F.2d 1399, 1402, 181 USPQ 641, 644 (CCPA 1974). Accordingly, the examiner's rejection of claims 15-20 under 35 U.S.C. §§ 102(b) and 103 over Eckert is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

JOHN D. SMITH
Administrative Patent Judge

CAMERON WEIFFENBACH
Administrative Patent Judge

CHARLES F. WARREN
Administrative Patent Judge

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